

NAVIGATION SYSTEM INCLUDING A DRIVE FOR READING OUT NAVIGATION
DATA AND A METHOD FOR OPERATING A NAVIGATION SYSTEM

The present invention relates to a navigation system including
a drive for reading out navigation data which is stored on a
data medium. A pregap exists on the data medium in addition to
the navigation data. The present invention also relates to a
5 method for operating a navigation system including a drive for
reading out navigation data from a data medium which in
addition has a pregap, logically ranked above the navigation
data.

10 In order to protect digital data media, CD-ROMs in particular,
from unauthorized duplication, a plurality of commercial
products for preventing duplication without impairing the
compatibility with the wide variety of existing play-back
15 devices are available on the market. However, the known
methods may be circumvented with more or less effort, so that
there is a risk of unauthorized duplication and usage of such
data media duplicated without authorization.

The object of the present invention is to provide a navigation
20 system and a method for operating a navigation system using
which effective copy protection for data media with navigation
data may be provided.

According to the present invention, this object is achieved by
25 a navigation system having the features of Claim 1 and by a
method having the features of Claim 5. Due to the fact that
identification information, which may be read out by the
drive, is stored in the pregap of the data medium, it is
possible that usage of the navigation data on the data medium

may be linked to the existence of such identification data or the existence of correct identification data. Since the standard duplicating equipment is not in the position to identify a pregap and copy it, an appropriate design of the
5 pregap content makes it possible to restrict usage or to grant a usage right. The rest of the navigation data may be read out only when the identification data, e.g., a copyright note, is actually present in the pregap. Furthermore, it is provided that a usage authorization is issued only when very specific
10 identification data is present, i.e., the rest of the navigation data may only be read out when the identification data is compatible with verification data stored in the navigation system.

15 Data media may thus be manufactured for a specific device or a line of devices. Even if the pregap could also be duplicated, the usage of the data medium would be restrictable to a certain line of models or to certain serial numbers of the respective navigation devices. Duplication would thereby lose
20 its appeal since it would not be able to be ensured that the duplicated data media would actually function in the present device.

A refinement of the present invention provides that the data
25 media are designed as CD-ROMs since they are widely used, robust, and easy to operate. Of course, alternative data media, such as a DVD, may be used, as long as the drive is able to recognize the data formats.

30 The pregap is advantageously provided with the physical address 0:00.0, and at the end of the pregap which is at the physical address 0:02.0, for example, the logical addressing starts with address 0 in order to prevent access by conventional CD burners or other duplicating equipment. The

start of the pregap would theoretically have the logic block address -150. That part of the data medium, which in ISO 9660 data systems cannot be addressed due to logic block addressing instead of physical addressing, is understood to be the

5 pregap. The usage authorization data, identification data, or a copyright is stored in this pregap which has a length of two seconds, for example. Only in the presence of this data is the rest of the data released.

10 An example of the present invention is explained in greater detail in the following based on the attached figure. The sole figure shows a schematic representation of the data structure on a data medium.

15 The figure shows a data track 1 which is composed of a pregap 2 and a useful data track 3. The physical address of pregap 2 as well as of useful data track 3 is plotted below data track 1. At the start of pregap 2, the physical address is made up of zeros, namely 0 min runtime and 0 sec runtime at frame 0. A
20 runtime of two seconds has elapsed at the end of pregap 2, the physical address 00 being indicated as the frame. Useful data track 3 including the navigation data, which occupies the remaining memory space, follows pregap 2, the remaining memory space being 74 minutes on a regular CD, which can be seen in
25 the lower right corner of the figure. The last logic block address "665850" is shown in the upper right corner of the figure.

At the start, pregap 2 is provided with the physical address
30 0:00.0 and at the end of the pregap, which is at the physical address 0:02.0, logic addressing, which is plotted on top, starts with the address 0 in order to prevent access by conventional CD burners or other duplicating equipment. The start of the pregap would theoretically have the logic block

address "-150." Only after the pregap, useful data track 3 starts with the appropriate logic block addresses "0" to "665850."

- 5 The read drive used (not shown) is able to read pregap 2 of a CD even though pregap 2 in ISO 9660 data systems cannot be addressed due to the deviating type of addressing (logic block addressing instead of physical addressing).
- 10 The program implemented here adds a two-second data block 2 in which a copyright is stored, for example, to the finished navigation CD. It is now possible to burn CDs having a predefined pregap 2 using which the existence of the copyright in the navigation system may be checked. If the copyright does
15 not exist, the CD will be rejected. Duplication of this CD using a standard CD burner is not possible.